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ABSTRACT

The purpose of this investigation was to design and test an information-eliciting question instrument in order to determine whether the structures in the verbal responses of young Mexican-American, bilingual children entering school would reveal the covert mental operations, concepts and oral language skills elicited. The basic objective was to make an in-depth study of such problems as the relationship between language and thought (how the bilingual child uses his thought as content for his language and how he uses his language to structure his thought), language interference (mixing and code-switching), and fluency. The study was therefore limited to 6 Ss (3 kindergartners and 3 first graders, including 3 boys and 3 girls, ages 6-7). The instrument consisted of 112 (56 parallel) questions in both English and Spanish. The results suggest that the instrument: (1) accounts for the language and thought components it elicited; (2) offers a different approach to the study of bilingualism in children entering school; and (3) reveals the match or mismatch between the language and thought processes already acquired by the Ss and those required for academic success with school-related tasks. In addition, the results dispel the view that a young bilingual child's initial ability or inability to experience academic success in school is primarily a language problem. (Author/CFM)

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ELICITING COVERT MENTAL OPERATIONS, CONCEPTS AND ORAL LANGUAGE SKILLS IN YOUNG BILINGUAL CHILDREN

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ABSTRACT

The purpose of this investigation was to design and test an information-eliciting question instrument in order to determine whether the structures in the verbal responses of young Mexican-American, bilingual children entering school would reveal the covert mental operations, concepts and oral language skills elicited. The basic objective was to make an indepth study of such problems as the relationship between language and thought--how the bilingual child uses his thought as content for his language, and how he uses his language to structure his thought--language interference (mixing and code-switching), and fluency. It was therefore limited to 6 Ss (3 kindergartners and 3 first graders including 3 boys and 3 girls, ages 6-7), who were used as their own controls. The instrument consisted of 112 (56 parallel) questions in both English and Spanish. A phrase structure analysis of the data collected was made in order to determine if a set of seven needs had been fulfilled as expressed by the early childhood bilingual teachers who precipitated the study. An ad hoc analysis was made to clarify any inconsistencies and to determine those questions which either failed to elicit any verbal information or evoked dissonant information. In the process, a bilingual rating was assigned to each S as it relates to language and thought.

The overall results revealed that the purpose and objective were achieved, and that the needs of the teachers were fulfilled. The results suggest the following conclusions: (1) The instrument, in its present form, accounts for the language and thought components it elicited. (2) It offers a different approach to the study of bilingualism in children entering school, and is thereby a worthwhile contribution to bilingual research, as well as to the development and implementation of bilingual programs. (3) It revealed the match or mismatch between the language and thought processes already acquired by the Ss and those required for academic success with school related tasks. This was done through discovering something of the bilingual child's ability to decode a convention and fit it into and interpret it according to his existing conceptual system in two languages. In addition, the results of the data dispel the view that a young bilingual child's initial ability to experience a measure of academic success in school is primarily a language problem. The data suggest that it is a combination of at least four complex problems, including (a) the capacity to consciously attend to a convention; (b) the capacity to decode that convention, re-encode it, and verbally respond to it; (c) the capacity for both inference and reference; and (d) the capacity to engage in the joint activity of conscious operational thinking, conceptualizing (symbolizing) and languaging.

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Eliciting Covert Mental Operations, Concepts and Oral Language Skills in Young Bilingual Children

1. Introduction

It has been increasingly accepted in the past decade to consider bilingual competence as the ability to operate in specified sociolinguistic situations in two languages with specified ease or effect. This view has been greatly influenced by the indepth insights of Spolsky (1969), McNamara (1966), Lambert (1955), Fishman (1965, 1969a, 1969b), and Mackey (1968). It has resulted in stunning perceptions of the nature of bilingualism and has permitted the application of powerful techniques of assessing bilingualism in children entering school based on observable and quantifiable data (Hollomon, 1973).

1.1 Context of the Problem

Depth of insight is often earned at the cost of variety of perspective. Consequently, while much has been learned about the problems of assessing bilingualism in children entering school, we have perhaps overlooked important considerations relative to the covert mental operations involved and the concepts and skills revealed in the phrase structures of a bilingual child's responses to information-eliciting questions in the testing situation. Our oversight has, perhaps, turned our attention away from the degree of match or mismatch between the modes of language and thought processes required for academic success in school related tasks and the cognitive processes which bilingual

children entering school have already mastered. Therefore, we believe that more attention should be paid to this problem because too little attention was paid to it in the past, and because it is very important in the assessment of bilingualism in children beginning school.

The young bilingual child's uses of either or both of his languages as instruments of thought are crucial to understanding whether or not he is able to initially cope verbally with academic tasks in either a bilingual or unilingual school. Because this area has not been adequately investigated, the assessment of bilingualism in children entering school has been distorted. That distortion has, of course, been in the direction of a preoccupation with language dominance, code mixing and code switching, syntactical and contextual variables as manifested in the results of assessment techniques such as rating scales, word-naming and verb-production, sentence imitation-repetition, and so-called free or spontaneous speech tests.

It is a preoccupation whose results have hopefully purged us of simple-minded techniques of bilingual assessment, and cleared the ground for a more pragmatically oriented approach to the study of bilingualism--that is--the relationship between the structures of the verbal responses of the child in his two languages and his ability to think and conceptualize his thoughts in either or both languages. As theorized in this investigation, his ability to verbally structure his two languages reveals both

how he used them as instruments of his thought and as means of conceptualizing his cognitive processes as manifested in his verbal skills (Taba, 1967). These combined functions are a joint activity of thinking and languaging--each requiring joint attention. Indeed, the very structures of his reponses to information-eliciting questions reflect these functions. What is needed then, is not so much a better understanding of language dominance and how the bilingual structures his two languages per se, but a better understanding of how he uses them to structure his thought and convey messages, based on universal cognitive processes and his already acquired conceptual system, as revealed in his aural-oral language skills. From this perspective, we can combine traditional methods of bilingual assessment with a new approach, and gain some useful insights not so much into what bilingualism is, as to how the bilingual uses his two languages as instruments of his thought--how his thinking serves as content for his languages, and how his languages mediate and structure his thinking.

1.2 Statement of the Problem

The purpose of this investigation was threefold: (1) to design an effective instrument for questioning young bilingual children entering school; (2) to use that instrument to determine whether or not the language structures in this verbal responses to a set of information-eliciting questions would reveal the covert mental operations, concepts and verbal skills

elicited in English and in Spanish; and (3) to determine the extent to which the instrument could be used to assess the bilingual child's ability to initially meet the language and thought requirements for academic success in school related tasks.

Consequently, this investigation was not concerned so much with an analysis of the grammatical structures in a subject's responses as it was with his ability to encode a convention of request, which requires attention and understanding, before he can comprehend, structure, and give appropriate responses. The relationship between the function of a verbal response and its phrase structure, we shall argue later, is crucial to understanding the bilingual child's ability to think and conceptualize his thoughts in either or both his languages. It is the interplay, the ability to switch, between the two that permits the child to operate in either language in specified sociolinguistic situations with specified ease or effect.

The structure of the bilingual child's verbal responses may be in very good correspondence with his covert mental operations, concepts, and aural-oral language skills. His communicative competence must reflect the nature of the mental operations whose output it encodes. In this manner, the verbal structures of his responses are central to the issue of language and thought.

It is assumed that mental development and language development take place in an irreversible sequence. That is, the

sequence is invariant in that it is fixed, and cumulative in that the child's language development and thought are qualitatively higher as manifested in his performance on various tasks in a specific sequence. Child-development literature supports this assumption. There is empirical evidence that a uniform sequence of ability development takes place similarly in all children (Piaget, 1926; Bayley, 1936; Gesell, 1940; Lillie, 1975). Consequently, our objective was not to find out how much of each language a child had already acquired, but rather to construct an information-eliciting question instrument and test its effectiveness in determining how he uses his languages to verbally express the cognitive abilities and concepts he already had. The covert mental operations and concepts were inferred. The oral language skills were manifested in the structures of the verbal responses.

1.3 Background of Investigation

It is significant that the background of this investigation was based on the following seven needs expressed by bilingual early childhood teachers enrolled in a graduate course on language development during early childhood at the University of Texas at San Antonio during the spring semester of 1975.

1. There was a need to know if parallel information-eliciting questions, in both English and Spanish, arranged in an ascending order of difficulty, would evoke the same or similar verbal structures in the responses of bilingual children

entering school, and whether or not these structures would reveal the same or similar covert mental operations, concepts, and language skills.

2. There was a need to know how to determine the extent to which young Spanish-English speaking children are more proficient in verbalizing concepts and skills requisite for academic success in Spanish, or in English, or equally proficient in both at the time they enter school, whether the school is bilingual or unilingual.

3. There was a need to know whether young Spanish-English speaking children can handle lower and higher order concepts elicited by lower and higher order information-eliciting questions equally well in both languages or better in one.

4. There was a need to develop a technique that could be effectively used to discover the match or mismatch between the verbal language and cognitive abilities already acquired by bilingual children entering school and those required for academic success in school related tasks.

5. There was a need to know the extent to which the technique of using informating-eliciting questions would evoke verbal responses in the appropriate language, and the extent to which the questions would evoke mixing the two languages or switching from one to the other.

6. There was a need to determine the extent to which the use of the instrumental technique would reveal whether the young

bilingual child is more fluent in one of his languages, or equally fluent in both, as measured by the number of pauses (seconds) occurring after a question was asked (after a three-second lapse of time) and before the response was initiated, and the number of pauses occurring within responses.

7. There was a need to know how to listen to and interpret the verbal responses of young bilingual children in the teaching-learning situation that calls language forth, using information-eliciting questions that appeal to their senses, things they can perceive in their physical and social milieus.

In our efforts to fulfill these needs, this investigation of bilingualism in children entering school is another attempt to solve some of the most basic problems in human psychology, which are of personal concern to at least half of the world's population.

Our major concern was to develop and test an information-eliciting question instrument that was flexible enough to be effectively used to yield a sufficient amount of observable and quantifiable data for purposes of making a descriptive analysis and discussion. We therefore limited our investigation to the same six subjects who were used as their own controls. In this way, it was possible for us to make a more indepth study of such basic problems as the relationship between language and thought, language interference as it refers to mixing and switching between the two languages, and fluency.

This was due to the fact that the subjects had a single level (pre-operational) of cognitive development, and, in instances of three of the six subjects, apparently two different levels of language development. We assumed that no new elementary concepts or mental operations were needed to yield the degree of match or mismatch between the modes of language and thought that the subjects had already acquired and those required for academic success in school related tasks. In the process, we were able to assign each subject a bilingual rating.

2. REVIEW OF RELATED LITERATURE

In our attempt to construct an information-eliciting question instrument that would evoke appropriate verbal responses from bilingual children entering school, which would yield their abilities to handle five basic concepts as manifested in their oral language skills and triggered by their covert mental operations, we, like Jakobovits (1969, p. 103), saw no wisdom or advantage in ignoring the potential contribution of theoretical and research developments in the related fields concerned with the study of language. Consequently, this review is divided into two sections: One deals with the general area of the problem, and the other deals with the specific area of the problem.

2.1 General Area of the Problem

Research shows that many children from Spanish surnamed families often speak Spanish in the home, and English in school (Hollomon, 1973). A large number of Mexican-Americans from disadvantaged backgrounds seem to lack sufficient mastery of either language (Manuel, 1965). These children have problems in school because they have difficulty understanding instructions, and seem to be inhibited in verbal communication. Sanchez (1954) addressed the problem of bilingual deficiency in noting that frequently a child only has fragments in two languages. This linguistic deficit results in the real problem, "retardation in conceptualization." In such a

case the child lacks the competence to verbalize his thoughts, ideas, concepts, and feelings, and the ability to recode incoming information.

Slobin (1972) points out that research in child language development has demonstrated that children learn language the same way all around the world; that despite the diversity of tongues, there are linguistic universals that seem to rest upon the developmental universals of the human mind, and, that every normal child masters his particular native tongue, and learns basic principles in a universal order common to all children.

Cazden (Hess & Bear, 1968) proposes "that the acquisition of grammar and vocabulary require different kinds of environmental assistance. Learning the meaning of words and thereby the relations among ideas seems to benefit from active tuition in the form of conversation between the child and an interested adult" (p. 136). In Carrow's (1967) study, she examined the influence of bilingualism on oral language. She found no significant difference between the bilinguals and the monolinguals on measures of verbal output, clause lengths, degree of subordination, and complexity of sentence structure. However, monolinguals were found to possess larger vocabularies, and to have fewer articulation errors. Bilinguals made the most common errors in the use of appropriate tense and appropriate prepositions. She concluded that bilingualsim is detrimental to language mastery.

Cohen (1970) concluded that "It seems that at the first-grade level many Mexican-Americans are not sure which code they are using--not just the label, but the actual components of speech" (p. 33). This lack of code consciousness was also found to be prevalent among the six- and seven-year-old Texas children that Cervenka (1967) tested. Weinreich (1951) concluded that bilinguals deviate from the norms in either language. If one learns a language, the inperfections of incomplete or haphazard learning would have to be built in, and the system might well be partially inconsistent as well as incomplete (Bolinger, 1968, p. 37). Rubin (1968) and Gumperz and Hernandez-Chavez (Cazden, John, & Hymes, 1972) have shown that in bilingual societies social information is conveyed by a switch from one language to another.

Experts in child language acquisition have studied the development of questioning and answering in the young child (Bellugi, in Riegel, 1965; Brown, 1968; Ervin-Tripp, in Hayes, 1970). Others have looked into the techniques of questioning, listening, and understanding the language of young children (Sund, 1975, & Yonemura, 1975). However, there is a need to know which forms of wh-questions in both languages elicit which verbal structures that manifest what concepts and skills that trigger which mental operations in the young Mexican-American bilingual child at the time he enters school.

2.2 Specific Area of the Problem

This investigation considers a different perspective on the study of bilingualism. "Achievement tests, which have been used in most bilingual research to date, are influenced by many factors other than conceptual thinking, notably knowledge, culture, and the quality of instruction" (Collison, 1974, p. 442). Other bilingual assessment techniques have dealt with linguistic interference, language dominance, and contrastive features found in the speaker of two languages (Hollomon, 1973). This investigation circumvents these problems by using information-eliciting questions to evoke untutored responses from children in their vernacular Spanish and in their everyday English to study their covert mental operations, conceptual thinking levels and oral language skills based on their verbal responses. Before describing the present investigation, a discussion of the relationship between language and thought in children entering school is in order.

Both language and thought depend on perception. To ask whether thought or language comes first, or whether one is more important than the other, is like asking which is more important to the farmer,the chicken or the eggs. One must understand the interdependence of both to understand either. It is pointless to consider the two separately. As viewed by Piaget (Duckworth, 1964), the level of understanding seems to modify the language that is used, rather than vice versa.

Mainly, language serves to translate what is already understood; or else language may even present a danger if it is used to introduce an idea which is not yet accessible. Leo Tolstoy realized more clearly than most other educators, during his time, the impossibility of simply relaying a concept in language from adult to child. "The development of concepts, or word meanings, presupposes the development of many intellectual functions: deliberate attention, logical memory, abstraction, the ability to compare and to differentiate" (Vygotsky, 1962, p. 83). These complex mental operations cannot be mastered through the initial learning alone, but rather through repeated interactions, analogies, and logical transformations.

Both language and thought develop within situations. Consequently, the child acquires new concepts and words from the specific contexts of his physical and social environment. Language is the accompanying verbal expression of the meanings of the messages conveyed in the interactions between the child and his environment. It gives form to the content of thought embodied in the interactions. It serves to articulate, mediate, and expand all perception in a symbolic code. As it relates to mental operations, it is used to unify and focus all child thought.

Although a child can understand many complex language structures before he can use them, this understanding is very

elementary and usually situation bound. This supports the premise that thought does in fact precede language, and, in fact, is a pre-condition for language development, if we expect children to know the meaning of what they say. Dewey (1933, p. 230) held three theoretical positions on the relationship between language and thought. "First, that they are identical; second, that words are the garb or clothing of thought, necessary not for thought, but only for conveying it; and third, that while language is not thought, it is necessary for thinking as well as for communication."

Vygotsky (1962) departs from Dewey's positions. He proposes that concept formation is a complex and genuine act of thought that can be accomplished only when the child's mental development itself has reached the requisite level. He emphasizes that at any age, a concept embodied in a word represents an act of generalization, but word meanings evolve.

> When a new word has been learned by the child, its development is barely starting; the word at first is a generalization of the most primitive type; as the child's intellect develops, it is replaced by generalizations of a higher and higher type--a process that lends in the end to the formation of true concepts" (p. 83).

Vygotsky holds that there can be words without thought and, conversely, thought without words. However, language can evoke

thought and, conversely, thought can evoke language. Consequently, word meanings can change with the various ways in which thought functions, and the functions of thought can change the meanings of words as the child develops. Vygotsky's leading idea can be reduced to this formula:

> The relation of thought to word is not a thing but a process, a continual movement back and forth from thought to word and from word to thought. In that process the relation of thought to word undergoes changes which themselves may be regarded as development in the functional sense. Thought is not merely expressed in words; it comes into existence through them. Every thought tends to connect something with something else, to establish a relationship between things. Every thought moves, grows, and develops, fulfills a function, solves a problem (p. 125).

Vygotsky views the development of thinking as a hierarchy of conceptual structures. He characterizes oral language as representing four qualitatively different levels of relationship thinking. "Relationship thinking refers to linkages among a group of perceived objects or events and varied in the degree of abstraction at the different levels" (Collison, 1974, p.443). The four levels are syncretic thinking, complex thinking, preconceptual thinking, and true conceptual thinking. Because this

investigation is limited to the language and thought in bilingual children entering school, ages five through seven, only the first two levels are discussed here. However, each level of thinking is the result of a complex activity in which all the basic intellectual functions take place. They are the means by which the child directs his mental operations, controls their course, and channels them toward the solution of the problem confronting him.

Syncretic thinking, according to Vygotsky, develops as the young child takes the first step toward concept formation when he puts together a number of objects in an unorganized congeries, or "heap," in order to solve a problem or answer a question. At that stage of development and thought, word meaning denotes nothing more to the child than a vague syncretic conglomeration of individual objects that have somehow or other coalesced into an image in his mind.

He considers this image to be highly unstable because of its syncretic origin. This is the lowest level of thinking. Based on the Weikart, Rogers, Adcock and McClelland (1971) cognitively oriented curriculum content areas, the two lower levels of conceptualizing in this investigation are referred to as classification, consisting of relational (association), descriptive (i.e., color, size, shape), and generic (conceptual class; i.e., animals); and seriation, consisting of ordering of sizes, quantities, and qualities.

Vygotsky defines complex thinking as comprising many variations in which individual objects are united in the child's mind not only by his subjective impressions but also by bonds actually existing between these objects. He views this new achievement, as an ascent to a much higher level. Thus, when the child moves up to that level, he has partly outgrown his egocentrism. "He no longer mistakes connections between his own impressions for connections between things--a decisive step away from syncretism toward objective thinking" (p. 61). Complex thought is coherent and objective thinking, although it does not reflect objective relationships in the same way as conceptual thinking. It begins the unification of scattered impressions; by organizing discrete elements of experience into groups, it creates a basis for later generalization.

To form such a concept, Vygotsky holds, it is also necessary to abstract, to single out elements, and to view the abstracted elements apart from the totality of the concrete experience in which they are embedded. Consequently, the advanced concept of inference or generalization presupposes more than unification, because in genuine concept formation, it is equally important to unite and to separate: "Synthesis must be combined with analysis. Complex thinking cannot do both. Its very essence is overabundance, overproduction of connections, and weakness in abstraction" (p. 76). This second requirement is the function

of the processes that ripen only during the third phase in the development of concept formation, though their beginnings reach back into much earlier periods. As treated in this investigation, based on the Weikart et. al. cognitively oriented curriculum content areas, the two higher levels of conceptualizing thinking are referred to as spatial relations, consisting of an awareness of body, position, location, direction, distance; and temporal relations, consisting of beginning and ending of time intervals, ordering of events, and different lengths of time within time periods. The highest level included is cause and effect relationships to determine the child's ability to deal with these concepts; which require him to unite and to separate--to synthesize and analyze.

The child's ability to respond to verbal cues depends on what already is in his conceptual system and the mental operations requisite to call that system into play. His language development is not an isolated aspect of his intellectual development but an essential part of the socialization process (Hebb, Lambert, & Tucker, 1973). His ability to translate what he already knows into language depends on the way he perceived, recalled, or imagined the event or object. He may recall a complex event in a different order from that in which it was originally perceived. The progressive socialization of thinking is the very essence of the child's language development. His language development plays a constructive part in the

socialization process, and thereby affects his development of thought. They are not in conflict of antagonistic, mutually exclusive forms of development. The child moves from egocentric thought to sociocentric thought "when he passes from primitive wordless perception to perception of objects guided by and expressed in words--perception in terms of meaning" (Vygotsky, 1962, p. 91). The socialization of thought marks an ascent to a much higher level of thinking. Therefore, the child's ability to identify, label, and list objects and events in his physical and social environment is not only an expression of his verbal skills, but also an index to the covert mental operations he uses to acquire his conceptual system.

It is an accepted truth that we develop all concepts through the senses. Therefore, the notion that the senses are also capable of abstract thought seems plausible. According to Arnheim (Patersen, 1972, p. 58), when the child perceives an object, he grasps the essential qualities of that object, or he does not see it at all. If he sees a round thing he is seeing roundness at the same time. The concept and the percept are united. Also when he looks at the world his eyes explore, select, simplify, analyze, synthesize, complete, correct, compare, combine, separate and put into context the objects that he sees. These higher mental operations have their roots in the origin of thought. In order for the child to handle them, at the most primary level or at a higher level, he must go back to the object,

event, or situation--the way it looks, feels, tastes, sounds, smells, and perceive its orgianizational structure, its functions, its qualities--the way it is.

It is no surprise that Brown (1973, pp. 74-78) observes that the first nouns that a child masters refer to concrete, tangible objects, and that the first verbs refer to observable physical actions. It is also little wonder that the young child strips language of all but the mere essentials--information loaded words and phrases.

In reference to young bilingual children in this age group Troike (1969, p. 98) concludes that a child's responses seem to give unequiovocal evidence that he has an adequate receptive knowledge of the stimulus dialect, and that he performs--instantaneous translation from that dialect into his native dialect. Such evidence should further give us pause at attempts to judge a childs' linguistic competence solely or even largely on the basis of his production, as we are prone to do, and as our tests are now largely designed to do.

Troike's conclusion is supported by Jakobovits (1969, p. 105) who argues that the effective information that is being transmitted in communication via sentences--that which the speaker intends the listener to understand--is the particular meaning not the general. This is what represents the conceptual event (idea) that he attempts to communicate to the

listener. To recover the particular meaning of a word or sentence intended by the speaker, he must engage in both an inferential and referential process. This allows him to make use of his knowledge of the overall situation to which the sentence as a whole refers.

2.3 Summary Statement

In summary, if we allow that classification, seriation, spatio-temporal relation and causality involve covert mental operations that can be evoked by information-eliciting questions, structured in verbal responses that reveal concepts and language skills, then the inseparability of language and thought is obvious. Taba (1967, pp. 16-26), using eliciting questions to evoke covert mental operations and verbal skills, identified three categories of thought processes or cognitive tasks: (1) concept formation, (2) interpretation of data, and (3) application of principles. She analyzed these three cognitive tasks from two perspectives: the operations or elements involved, and the sequential steps necessary for matering them. Her eliciting questions, which explain the sequential steps, appear to be a practical, generic model that both the investigator and the teacher may use to develop questioning techniques for children.

We agree with Vygotsky (pp. 55-56) that in this investigation we are faced, then, with the following state of affairs: To ask the bilingual child a series of parallel information-eliciting questions in English and in Spanish; arrange them in ascending order; determine if he is able to grasp each question,

and to visualize the goal it sets, and structure an appropriate verbal response at this stage of his development. At the same time, we recognize that tasks of understanding and communication are essentially similar for the child and the adult. Although the child develops functional equivalents of concepts at an extremely early age, the forms of thought that he uses in dealing with these tasks differ profoundly from the adult's in their composition, structure, and mode of operation. We also recognize that all the higher mental operations are mediated processes, and signs are the basic means used to master and direct them. That is, the mediating sign is incorporated in their structure as an indispensable, indeed the central, part of the total process. As it relates to concept formation, the sign is the word (the child's verbal skill), which at first plays the role of the means of forming a concept and later becomes its symbol--the word becomes synonomous with the object or event it represents.

Finally, we recognize that no level of information-eliciting question that demands the formation of concepts can in itself be considered the cause of the process. However, if in the child's environment no such questions are asked him--that elicit new or different information from him, and that stimulate his intellect by providing a sequence of new goals--his thinking fails to reach the highest stages, or reaches them with great delay, and thereby affects his language development. Therefore, we aimed to better understand the intrinsic bonds between the

external tasks and the dynamics of conept formation. We view concept formation as a function of the child's total social and cultural growth, which affects not only the content but also the method of his thinking. The analysis of this view is beyond the scope of this investigation.

3. METHOD

The underlying objective of this investigation was to attempt to fulfill the seven needs expressed by early childhood bilingual teachers enrolled in a graduate course on language development during early childhood at the University of Texas at San Antonio during the spring semester of 1975. In the process, every effort was made to provide them with a refined technique of questioning young children for purposes of assessing their ability to handle five basic concepts as these relate to language and thought. In this manner, it was assumed that the results of collection and analysis of data would provide them with useful information relative to the degree of match or mismatch between the modes of language and thought processes required for academic success with school related tasks and those which bilingual children entering school have already acquired.

3.1 Subjects

Because our major concern was the development and testing of an information-eliciting question instrument that was flexible enough to be effectively used to yield a sufficient amount of observable and quantifiable data for purposes of making a descriptive analysis and discussion, this investigation was limited to six subjects who were used as their own controls. They were selected based on five criteria: (1) Spanish surnamed, (2) sex, (3) entering school for the first time as a

kindergartner or as a first grader, (4) presently enrolled in a bilingual program with a disposition to speak both English and Spanish, and (5) children of low socioeconomic status parents.

The subjects were selected by their respective classroom teachers, as requested by the investigative team, based on the above mentioned criteria. They resided in the San Antonio area, but were enrolled in three elementary schools in three different independent public school districts, two of which are located in the urban setting, and the other would be more appropriately described as a rural or small town setting.

For the purpose of anonymity, the subjects were given code numbers from 1 to 6. The odd numbers were assigned to the boys and the even numbers represent the girls. S1, S2, and S3 were first graders, and S4, S5 and S6 kindergartners. Their ages were listed in terms of years and months for the kindergartners as follows: both S4 and S6 = 6.3 and S5 = 6.2: for the first graders, S1 and S2 = 6.9 and S3 = 7.5. Based on their teachers' evaluations, two of the first graders (S1 and S2), due to their academic progress, were assigned to the above-average group in their class, and one (S3) was assigned to a group comprising the lower third of the class. Two of the kindergartners (S4 and S6) were assigned to above-average groups in their classes and one (S5) to the "average" group.

The language-arts programs in each of the independent public school districts differed. Subjects S5 and S6 were receiving

instruction in the Instructional Concepts Program developed by the Southwest Regional Laboratories and published by Ginn and Company. This program is designed to help kindergarten children learn to label concepts which are important in school in both English and Spanish. S4 was receiving instruction in the Bilingual Kindergarten program developed by the Southwest Educational Development Laboratory and published by the National Education Laboratory Publishers. The basic goals of this program are to develop self-awareness, self-esteem and cultural pride, perceptual motor and cognitive skills, language development in the first language, and thinking and reasoning skills. In addition, this subject was receiving oral language instruction in English using the Region One Curriculum Kit.

S1 and S2 were receiving instruction in oral language and reading in the well known DISTAR Reading and Language program developed by Siegfried Engelmann and Elaine C. Bruner. S3 was receiving instruction in reading in English in the BOLAR Program developed by the Southwest Educational Development Laboratory and published by the National Educational Laboratory Publishers. The BOLAR Program seeks to implement three basic approaches: (1) language experience, (2) sight word through the use of pocket chart strategies, and (3) the phonic. This subject was also receiving instruction in oral Spanish for approximately twenty minutes each session on alternate school days. Although the subjects were exposed to different language-arts

programs, it is to be noted that each of these programs stressed the development of basic concepts and oral language expression, prerequisites for academic success in the school.

3.2 Instrumentation

The information-eliciting question instrument was developed by the principal investigator. It was pilot-tested in English on one hundred and forty children between the ages of 3-8, including a cross-section of Anglo, Black, and Mexican-American children of parents of all socioeconomic levels. It was administered by forty graduate students enrolled in a course on language development during early childhood at the beginning of the fall and spring semester, respectively during the 1974-75 academic school calendar year. The original instrument consisted of twenty information-eliciting question forms arranged in an ascending order of difficulty, the predicted covert mental operations, concepts, and skills, and grammatical structures of responses. Each administrator fortuitously constructed his own questions and selected his own subjects. The overall results of each administration indicated that the instrument was effective in evoking the covert mental operations, concepts and oral language skills elicited as manifested in the structures of the responses of the subjects. These results allowed us to glean the types of questions that were likely to elicit the greatest amount of verbal responses.

After each of the two administrations of the instrument,

the graduate students were asked to comment or make suggestions relative to its improvement. These were collected and compiled as follows: (1) Use several question types of the same question form. (2) Categorize the concepts elicited in an ascending order (i.e., classification, seriation, spatial relations, temporal relations, and cause and effect relations); those that are considered to be requisite for academic success in the first grade. (3) Describe the verbal responses in terms of their phrase structures in lieu of a subsequent analysis of immediate constituents, which is time consuming, and which offers little useful information to the kindergarten or first-grade teacher whose primary concern with language instruction is to help the child to develop receptive-expressive language skills.

The above suggestions were considered and included in the revised instrument as presented in the analysis of data. It now consists of fifty-six questions in English with parallel fifty-six questions in Spanish. In this manner, it can be used either unilingually or bilingually. The overall development of the instrument was based primarily on Taba's (1967) rationale for teaching strategies for cognitive growth, and secondarily on Bloom's (1956) schematic arrangement of human abilities and related outcomes of learning, the Weikart et al (1971) expansion of the three-sided planning framework of levels of conceptual development, Bellugi's (1965) study of the development of interrogative structures in children's speech,

Brown's (1968) research on the development of questions in child speech, Erwin-Tripp's (1970) investigation on how children answer questions, and Wilkinson's (1971) cognitive uses of language. The parallel questions, in both languages, were arranged in an ascending order of difficutly for purposes of analysis. For the economy of space, only English examples are given here. They ranged from simple questions requesting information based upon perceptual discrimination such as "What is in your house?" and "Who is your mother?;" to those requesting greater accuracy about information supplied such as "What size are your shoes" and "How much do you weigh?;" to those requiring memory and recall of spatio-temporal relations such as "What do you do when you get home from school?;" to those requiring analogies such as "How long do you stay in school?" and "How often do you come to school?;" to those requiring explanations of awareness of relationships based on facts such as "Why do you go to school?" and "Why do you sleep?"

The development of the instrument was a fortuitous attempt to design an effective technique for eliciting information from the subjects that was within the limits of their perceptions and within their life spaces. We assumed that information would be more easily elicited from this age-group by questions containing frequently used words, with a higher proportion of concrete referents and a lower proportion of abstract referents. In the process, every attempt was made

to appeal to their sensory modalities--things they probably had perceived in their physical and social environment--and to gradually assess their ability to verbally structure their experiences from the concrete to the abstract and from the simple to the complex. The questions were structed based on the language typically used in the subjects' social milieus (Appendix)

It may appear that a child's ability to answer these questions depends mainly on prior knowledge. But, in spite of the fact that a concept is knowledge already schematized, this factor is minimized by structuring questions that evoke a level of experience that virtually all kindergarten and first-grade children, regardless of their socioeconomic status and ethnic identity, are assumed to possess, at least at the lower levels. The effects of the questioning procedures were viewed as a direct derivative of the extent to which the questions induced the retrieval and processing of a particular set of referential associations (Johnson, 1975, p. 431). Thus, the child's essential task was to pay close attention and understand the question, then to verbally respond to it based on his experience. The wording of the questions begins at a relatively low level of difficulty and as the questioning progresses, the level of required mental operations become more complex and the concepts and skills more complicated and abstract. In addition, for the most part, the questions were

open-ended; only a few required more specific answers such as "Who is your teacher?," "Whose house do you live in?," and "How does water feel?" It is to be noted that these types of questions refer to significant others and familiar experiences.

We also considered the possibility that a child may be able to handle a particular concept as far as one particular question of classification, seriation, spatial relations, temporal relations, or causality is concerned, but may or may not be able to handle the same concept with regard to a higher-order question. For example, a child may be able to handle a serial ordering of sizes, quantities, and qualities before it becomes the object of conscious elucidation or of reflection (Piaget, 1971, p. 1971) at the temporal relations level (ordering of events, beginning and ending of time, and length of time within time periods). Consequently, the instrument is designed to reveal which forms of eliciting questions in both languages evoke which verbal structures that manifest what concepts and oral language skills that trigger which mental operations in bilingual children entering school.

3.3 Data Collection

Three of the investigators administered the inforamtion-eliciting question instrument to the six subjects. They were native Mexican-American females; each born and reared in the San Antonio area. Each was a Spanish-English speaking bilingual

early childhood teacher and a graduate student in early childhood education at the University of Texas at San Antonio during the spring semester. The instrument was administered during the last week of March, 1975.

The instrument was administered at the respective schools in which the subjects were enrolled, but in an empty classroom so as to minimize distrubances and any other interference during each questioning session. Instructions were given in both languages: "_____, I'm going to ask you some questions in English and in Spanish. Listen carefully and pay close attention to each question. Be sure that you understand each question before you answer me. If you do not understand a question, ask me to repeat it. If you do not know the answer to a question, just tell me that you do not know. Alright; ready? Let's begin!" "Ahora voy a decirte exactamente en español lo que acabo de decirte en inglés. Voy a preguntarte unas preguntas en inglés y en español. Escucha bien y fíjate bien en cada pregunta. Asegúrate bien de que entiendas cada pregunta antes de contestarme. Si no entiendes una pregunta, dime y la repito. Si no sabes contestar una pregunta, no hay que hacer más que decirme que no lo sabes. Bueno; listo? ¡Vamos a empezar!

After the directions had been given, the record button was depressed and the recorder checked. The record level for the child's responses, and the playback volume were verified and

readjusted, if necessary. The microphone was tied around the child's neck, and the investigator held the recorder so that she could be free to move if necessary. Every attempt was made to allay any doubts or fears the child may have had concerning the questioning situation. Only the investigator and the child were present in the room during each questioning session.

S1 and S2 were administered the instrument in both languages on the same day, which took about fifteen minutes each. Subjects S4-S6 were questioned in English on one day and in Spanish of another day, which took about thirty to forty minutes each for English and Spanish. Since no time limit was set, if a child appeared to become fatigued, the questioning was stopped so that he could rest before resuming.

The responses were immediately transcribed by the administrator for the two subjects she questioned while recall was fresh. They contained only the child's responses, as the questions were standardized. Each transcription was numbered to correspond to the question asked. All four investigators studied both the tape recordings and the transcriptions. Three of them analyzed, judged, and described the data.

4. ANALYSIS OF DATA

The analysis of the data collected first required a rationale for describing the responses in terms of their phrase structures. Second, we analyzed the data in terms of the relations of these phrase structures to the covert mental operations and concepts and oral language skills manifested. Third, we examined the data to determine fluency, mixing, and switching in responses to certain questions. Fourth, we determined the extent to which the results of the analyzed data fulfilled the seven needs expressed by the bilingual teachers who precipitated this investigation. Then, fifth, we proceeded to assign a bilingual rating to each subject. In addition, we conducted an ad hoc analysis in the Discussion Section to determine which questions either failed to evoke any information or evoked dissonant information.

4.1 Rationale for Phrase Structure Description

Describing the responses in terms of their phrase structures without a subsequent analysis of immediate constituents provides us with something of the endless creative power of the bilingual speaker of English and Spanish. This approach provides the language researcher with the lexical units or information-loaded phrases over which the speaker has control. It also serves as an effective technique for determining how the bilingual speaker uses his languages for mediating the

relationships between objects, events, and situations in his physical and social environment. It further provides a relatively clear basis for classifying the covert mental operations, concepts and skills, and the lexical units or structures that behave similarily. In addition, the researcher is able to use the phrase structures to discover how the bilingual speaker uses his languages to structure his thoughts, verbalize his concepts, reveal their uses, express his will and communicate these to others. Finally, it provides a basis for predicting the speaker's ability to generate similar structures with ease or effect in specified sociolinguistic situations with other bilingual interlocutors.

A young child entering school whose native language is other than English, although having been in a bilingual classroom for seven months, is most likely to answer open-ended, information-eliciting questions using phrase structures in either of his languages in lieu of complete sentences. To keep the two languages separate while becoming bilingual, a child uses mostly lexical units in repsonse to such questions. He usually strips both languages of all except the essential information-loaded words and phrases.

4.2 Relations of Phrase Structures in Responses to Covert Mental Operations, Concepts and Skills

The phrase structures in the verbal responses to the information-eliciting questions revealed five interrelated, de-

velopmental paradigms, which were analyzed and tabulated. These revelations were based on the premise that the development of covert mental operations and concepts and oral language skills are the functions of regulating joint activity and joint attention. These functions are the results of physical and social actions and interactions and the damands the questions placed on the child's need to communicate clearly and effectively. Indeed, the very structures of their responses reflected these functions. Because they were information-eliciting questions, the young child, for the most part, stripped his responses of all but the bare essentials--information-loaded words and phrases. Although no effort was made to get the child to respond in complete sentences, in a few instances, a child did respond in complete sentences. Our primary objective was not to find out how much of each language a child had already acquired, but rather to determine how he used his languages to express the concepts he already had.

The five interrelated, developmental paradigms are conceptualized in the following modes: (1) classification, (2) seriation, (3) spatial relations, (4) temporal relations, and (5) cause and effect relations. The order in which they are presented indicates that they supplement but do not replace each other; they are integrative and cumulative.

4.2.1 The First Mode

The first mode, as presented in Table 1, revealed the

BILINGUAL, INFORMATION-ELICITING QUESTION INSTRUMENT, DEVELOPED BY JOHN W. HOLLOMON, PH.D.

TABLE 1: CLASSIFICATION PARADIGM

ELICITING-QUESTION FORM	NO. ASKED	COVERT MENTAL OPERATION	CONCEPT/SKILL	NO. OF PHRASE STRUCTURES IN RESPONSES OF SUBJECTS S1	S2	S3	S4	S5	S6
1. What + be	2	Discrimination Differentiation	Generic classification of objects and people: Identify/label/list	9 NP	10 NP	2 NP	2 NP	4 NP	2 NP
¿Qué + hay	2	Memory/Recall		8 NP	5 NP	2 NP	2 S	2 NP	2 NP
2. What + do + ADVP.	3	Differentiation	Generic classification of action: label/list	10 VP	13 VP	3 VP	3 VP	2 VP	2 VP
¿Qué + hacer + ADVP	3	Memory/Recall		8 VP	7 VP	3 VP	3 S	1 S	1 S
3. What + do + V	3	Perception Discrimination	Generic classification of objects and people: identify/label/list	8 NP	8 NP	6 NP	4 NP	4 NP	2 NP
¿Qué + V	3			9 NP	9 NP	1 NP	3 NP	3 NP	3 NP
4. Who + be	3	Recognition Recall	Generic classification of people: identify/label/list	3 NP/1S	5 NP	6 NP	5 NP	4 NP	5 NP
¿Quién + ser	3			5NP/1S	4NP/1S	3 NP	16 NP	2 NP/1S	5 NP
5. Who + ser + Rel + V	1	Recognition Recall	Relational classification of people: identify/label/list	4 NP	3 NP	2 NP	1 NP	2 NP	2 NP
¿Quién + be + Rel + V	1			1 Pron P	3 NP	1 NP	2 S	2 NP	2 NP
6. Who + do + V + with	2	Recognition Recall	Relational classification of people: identify/label/list/locate	9 NP	2 NP/1S	1 NP	1 NP	1 NP	3 NP
¿Con quién + V	2			9 NP	6 NP	2 NP 1 ADVP	3 NP	4 NP	3 NP
7. Whose	2	Recognition Recall	Associational classification of people and places: identify/label/locate/possession	2 NP	2 NP	2 ADJP	1 ADJP	1 NP	1 Pron P
¿De quién	2			2 NP	2 NP	1 ADVP	1 ADVP	3 Pron P	2 Pron P 1 S

KEY: NP = noun phrase; VP = verb phrase; S = sentence ⟶ NP + VP; Pron P = pronoun phrase; Rel = relator; ADJP = adjective phrase; ADVP = adverb phrase

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BILINGUAL, INFORMATION-ELICITING QUESTION INSTRUMENT, DEVELOPED BY JOHN W. HOLLOMON, PH.D.

TABLE 1: (CONT.)

ELICITING-QUESTION FORM	NO. ASKED	COVERT MENTAL OPERATION	CONCEPT/SKILL	NO. OF PHRASE STRUCTURES IN RESPONSES S1	S2	S3	S4	S5	S6
8. What kind	2	Discrimination Association Comparison	Descriptive classification of events and situations: identify/label/list	3 NP	2 NP	2 NP	4 NP	2 NP	2 NP
¿Qué clase	2	Selection		3 NP	2 NP	--	7 NP	2 NP	2 NP
9. What color	2	Differentiation	Descriptive classification	4 ADJP	4 ADJP	4 ADJP	2 ADJP	3 ADJP	3 ADJP
¿De qué color	2	Recognition	of color: identity/label	4 ADJP	4 ADJP	4 ADJP	3 S 4 ADJP	3 ADJP	3 ADJP
10. What + can + tell about	1	Recognition Extrapolation	Descriptive classification of attributes: label/list	3 S	4 S	1 S	1 ADJP	1 NP	2 S
¿Qué + decir + de	1			1 S	3 S	--	1 ADJP	--	1S
11. What shape	2	Differentiation Comparison	Descriptive classification of shape and structure: identify/label/list	2 ADJP	2 ADJP	2 NP	2 ADJP	1 NP	2 NP
¿Qué forma	2			2 NP	2 NP	1 ADJP	2 ADJP	1 NP	1 S
12. How + be	1	Perception	Descriptive classification of manner, condition or characteristic: Label	1 ADVP	1 ADVP	1 ADVP	1 S	--	--
¿Cómo + estar	1			1 ADVP	1 ADVP	1 ADVP	1 ADJP	--	1 ADJP
13. How do (PAST) + come	1	Information retrieval	Descriptive classification of method: label/explanation	1 ADVP	1 ADVP	--	1 ADVP	1 ADVP	1 S
¿Cómo + llegar (PAST)	1			1 ADVP	1 ADVP	--	1 ADVP	1 S	2 S
14. How + do + feel	1	Information retrieval	Descriptive classification of characteristic, manner, touch: label/list	3 ADJP	4 ADJP	1 ADJP	1 ADJP	1 ADJP	1 ADJP
¿Cómo + sentirse	1			3 ADJP	4 ADJP	--	1 ADJP	1 ADJP	1 ADJP

KEY (CONT.): -- = no information evoked.

extent to which the subjects had acquired the paradigm for verbalizing relational, descriptive and generic classification of objective data and social reality. The questions elicited simple information relative to the existence of events, objects, and people, which were labeled or classified based on their structures, functions, and attributes. The responses required the joint activity of oral language expression and perceptual attention such as discrimination, differentiation, recognition, memory, recall. It is to be noted that descriptive classification has no independent existence, although the child may speak of salient features as if they did exist independently by abstracting, for example, from objects, their attributes or properties.

4.2.2. The Second Mode

The second mode, as presented in Table 2, revealed the extent to which the subjects had acquired the paradigm for verbalizing the concept of serial ordering of sizes, qualities and quantities as these exist within the contexts of situations in their environment. The questions elicited and evoked greater accuracy about information supplied. The responses required such mental operations as differentiation, comparison, grouping, recognition, selection, recall, evaluation.

4.2.3 The Third Mode

The third mode, as presented in Table 3, revealed whether or not they had acquired the paradigm for verbalizing the

TABLE 2: SERIAL ORDERING PARADIGM *

ELICITING-QUESTION FORM	NO. ASKED	COVERT MENTAL OPERATIONS	CONCEPT/SKILL	NO. OF PHRASE STRUCTURES IN RESPONSES OF SUBJECT S1	S2	S3	S4	S5	S6
15. What size	2	Differentiation	Serial ordering of size:	2 Pron P	2 Pron P	1 ADJP	1 Pron P	1 Pron P	1 Pron P
¿Qué tamaño	2	Comparison	label/list	2 Pron P	2 Pron P	--	2 ADJP	1 Pron P	1 Pron P
16. Which + be	1	Differentiation	Serial ordering of rela-	1 NP	1 NP	1 NP	1 NP	1 NP	1 NP
¿Cuál + ser	1	Comparison	tive size: label	1 NP	1 NP	1 NP	1 NP	1 NP	1 NP
17. Which + like	1	Differentiation Comparison	Serial ordering of quali- ties: label/list	1 NP	1 NP	1 NP	1 NP	1 NP	1 NP
¿Cuál + gustarse	1	Selection		1 NP	1 VP	--	2 NP	1 NP	1 NP
18. How many + be	1	Recognition/Recall	Serial ordering of quanti-	7 NP	4 NP	2 NP	1 NP	--	2 NP
¿Cuántos + hay	1	Grouping	ties: label/list	3 NP	4 NP	2 NP	1 NP	1 NP	1 NP
19. How many + do + V	1	Grouping	Serial ordering of quanti-	2 NP	1 S	1 S	16 NP	1 NP	2 NP
¿Cuántos + V			ties: label/ list	2 NP	1 S	1 PronP	1 Pron P	1 S	1 S
20. How much + do + V	3	Differentiation	Serial ordering of quanti-	2 ADJP	2 ADJP	1 PronP	2 PronP	2 ADJP	2 ADJP
¿Qué tanta + V	3	Grouping	ties: label	2 ADJP	2 ADJP	1 PronP	1 S	2 ADJP	1 ADJP
							1 PronP		
21. How much + can + V	1	Recognition Differentiation	Serial ordering of quanti- ties: label/list	1 ADJP	1 ADJP	1 PronP	1 PronP	1 ADJP	
¿Qué tanta + po- der + V	1	Grouping		1 ADJP	1 ADJP	1 PronP	1 PronP	1 ADJP	1 NP
22. How much + weigh	2	Comparison	Serial ordering of weight:	2 PronP	2 PronP	1 PronP	2 PronP	--	--
¿Qué tanto + pe- sar	2	Evaluation	label	2 PronP	2 NP	--	2 PronP	--	--
23. How big + be	2	Differentiation	Serial ordering of sizes:	2 ADJP	2 ADJP	--	1 S/1ADJP	2 ADVP	1 ADJP
¿Qué tan grande + ser	2	Comparison	label/explanation	2 ADJP	2 ADJP	1 S	2 ADJP	1 NP	1 NP
								1 ADVP	1 ADJP

*BILINGUAL, INFORMATION-ELICITING QUESTION INSTRUMENT, DEVELOPED BY JOHN W. HOLLOMON, PH.D.

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TABLE 3: SPATIAL RELATIONS PARADIGM *

ELICITING-QUESTION FORM	NO. ASKED	COVERT MENTAL OPERATION	CONCEPT/SKILL	NO. OF PHRASE STRUCTURES IN RESPONSES OF SUBJECTS S1	S2	S3	S4	S5	S6
24. Where + be	2	Differentiation Recognition	Spatial relations between people and places: label/explanation	2 ADVP	1 ADVP 1 S	2 ADVP	2 ADVP 2 NP	2 ADVP	2 ADVP
¿Dónde + estar	2	Recall		2 ADVP	1 ADVP 1 S	2 ADVP	2 ADVP	2 ADVP	1 ADVP
25. Where + do + V	2	Differentiation Recognition	Spatial relations between people, actions, places: label/list	3 ADVP	2 ADVP	2 ADVP	2 ADVP	2 ADVP	2 ADVP
¿Dónde + V	2	Recall		2 ADVP	2 ADVP	2 ADVP	2 ADVP	2 ADVP	2 ADVP
26. How far + V + from	2	Abstracting Problem-solving	Spatial relations--distance between places: label/direction	2 NP	2 NP	--	2 ADVP	1 NP	1 ADVP
¿Que tan lejos + de				2 NP	2 NP	--	1 S 1 ADVP	2 ADVP	2 ADVP

*BILINGUAL, INFORMATION-ELICITING QUESTION INSTRUMENT, DEVELOPED BY JOHN W. HOLLOMON, PH.D.

BILINGUAL, INFORMATION-ELICITING QUESTION INSTRUMENT, DEVELOPED BY JOHN W. HOLLOMON, PH.D.

TABLE 4: TEMPORAL RELATIONS PARADIGM

ELICITING-QUESTION FORM	NO. ASKED	COVERT MENTAL OPERATION	CONCEPT/SKILL	NO. OF PHRASE STRUCTURES IN RESPONSES OF SUBJECTS S1	S2	S3	S4	S5	S6
27. Which + come	1	Differentiation Comparison	Temporal ordering of events: label/list	1 ADVP	1 ADVP	--	1 ADVP	--	--
¿Cuál + venir	1	Selection		1 ADVP	1 ADVP	--	1 ADVP	--	--
28. When + do + go	1	Differentiation Recognition	Temporal ordering of events: label/list	1 ADVP	1 ADVP	--	1 ADVP	--	--
¿Cuándo + ir	1	Recall		1 ADVP	1 ADVP	--	1 ADVP	1 S	--
29. What + do + when + V	1	Recognition Memory/Recall	Spatio-temporal relations between actions, people, places: label/list	2 VP	3 VP	2 VP	1 S	1 S	--
¿Qué + hacer + cuando + V	1			2 VP	3 VP	1 VP	1 VP	1 S	1 S
30. How often + do + V	2	Generalization Inferring	Temporal ordering of events and time frequency: label/ list	2 ADVP	2 ADVP	1 ADVP	2 ADVP	1 ADVP	2 ADVP
¿Qué tan sequido + V	2			2 ADVP	2 ADVP	1 NP	2 ADVP	1 ADVP	1 ADVP
31. How long + V + ADVP	2	Abstraction Problem-solving	Temporal relations between beginning and ending of time intervals--linear measure of time: label/explanation	2 ADVP	2 ADVP	1 ADVP	2 S 1 Pronp	--	--
¿Qué tanto tiempo + ADVP	2			2 ADVP	2 ADVP	--	2 PronP	1 S	--

TABLE 5: CAUSE AND EFFECT RELATIONS PARADIGM

32. Why + do + go	2	Differentiation Reasoning Analyzing Information/re-trieval	Cause and effect relation-ships: identity/label/list/ explanation	5 Comp*	5 Comp	2 Comp	2 NP	1 S	1 NP
¿Por que + ir	2			5 Comp	5 Comp	2 Comp	2 NP	1 Comp	3 S
33. Why + do + V	2	Differentiation Comparison Abstraction Reasoning Information/re-trieval	Cause and effect relation-ships: identify/ label/ list/ explanation of related points	4 Comp	4 Comp	1 Np	1 NP 1 ADVP	1 S 1 Comp	2 S 1 NP
¿Por que + V	2			3 Comp	2 Comp	1 Comp	2 NP	1 Comp 1 NP	2 S 1 NP

*Comp = compliment, a nominalized verb phrase

concept of spatial relations as these exist between people, actions and places. The eliciting questions evoked responses that required the mental operations of differentiation, recognition, recall, abstraction, problem-solving.

4.2.4 The Fourth Mode

The fourth mode, as presented in Table 4, indicated whether or not they had acquired the paradigm for verbally expressing temporal relations as these exist between people, actions, events, and places. The questions were structured to elicit and evoke responses requiring greater analogies of information given. These required the mental operations of recognition, recall, differentiation, comparison, selection, generalization, inferring, abstraction and problem solving.

4.2.5 The Fifth Mode

The fifth mode, as presented in Table 5, indicated the extent to which the subjects had acquired the paradigm for explaining cause and effect relationships. The eliciting questions evoked phrase structures requiring explanations of awareness of relationships based on facts, which require a certain high degree of high level activity to structure the response that describes or explains the associations already acquired. These required the mental operations of reasoning, differentiating, analyzing, information-retrieval, comparison, and the like. All of these operations depend upon factual knowledge which is a prerequisite to man's highest intellectual activities (Travers, 1970, p. 119).

4.2.6 Explanation of Developmental Paradigms

Again, the order in which these five modes are presented should not be interpreted as a developmental sequence. However, they can be interpreted in terms of developmental paradigms. Many aspects of all five occur simultaneously. For example, when a child sees an orange, he perceives its structure; his awareness of its uses comes into play, as well as its properties; he is seeing it somewhere during a period of time; and it may bring into awareness some reason for liking or not liking it. All of these aspects may be brought to bear on the cause of its existence in space and time. He perceives, if he is consciously attending, all these at the same time.

However, the conscious attending to all these aspects requires operatons of complex and genuine acts of thought that can be accomplished only when the child's mental development has reached the requisite level.

When the child has reached this level--has acquired all five paradigms--according to Arnheim (Petersen, 1972, p. 58), he perceives an object and grasps the essential qualities of that object, its total existence. The concept and the percept are united. He then recognizes expression in human or inanimate objects or events because each is organized to convey a message about itself.

Consequently, a child may be able to give appropriate information in response to a particular question in one paradigm, but he may not be able to respond appropriately in either of his two languages to a similar question requiring a certain high degree of high level mental operation in a neighboring paradigm. The structuring of responses to information-eliciting questions is not innate, but structured little by little, and this process of construction presupposes not only an already existing conceptual system to assimilate and transform the information elicited into language structures, but also an adaptation of the mind to reality, the proper exercise of mental activity. With this view, Bolinger (1968, p. 37) sees the plausibility of whatever it is that we call thought presents itself at the door of language with a complete

set of specifications including the creation of new ideas, and getting back from language, by some subtle form of conditioning, precisely the responses that correspond to each of the components of the thought.

4.3 Fluency, Mixing, and Code-Switching

We analyzed the data to determine the fluency of responses, the mixing of the two languages in responses, and the switching from the language in which the question was asked to respond in the other. The specific questions which evoked these and the data analyzed are presented in Table 6.

4.3.1 Fluency

Fluency was determined by measuring the speed of responding to questions in both English and Spanish. This was computed by two measures: (1) given a three-second lapse of time we tabulated the number of pauses or seconds occurring after a question was asked before the response was begun, and (2) before a response ended we tabulated the number of seconds occurring within responses, between words and phrases. There were no puases recorded in the responses of S1, S2, and S6. They are therefore not included in the data presented under fluency. The greatest number of pauses recorded was for S4, which occurred in her responses in English. However, these pauses did not adversely affect her overall speech productions. Less pauses were recorded for S3 and S5. Pauses provide evidence that phrase

TABLE 6: FLUENCY, MIXING, AND SWITCHING

INFORMATION-ELICITING QUESTION NO.	FLUENCY			MIXING			SWITCHING		
	S3	S4	S5	S3	S5	S6	S4	S5	S6
1. What is in your house?			-3-						
2. ¿Que hay en tu casa?					2E				
3. What is in your classroom?			-2-						
4. ¿Que hay en tu cuarto?	-1				2E			1E	
6. What do you do at home?		-5							
8. ¿Que haces en la escuela?								1E	
10. ¿Que hacen los niños en la clase?			-6						
11. What do you see in the classroom?	-2-								
12. ¿Que ves en tu cuarto?								1E	
14. ¿Que ves en la yarda?									1E
15. What do the children see in the classroom?	-6-								
16. ¿Que ven los niños en el cuarto?								1E	
21. Who are your friends?	-3-	-2					Sp		

KEY: - before a numeral indicates that the pauses occurred after the question was asked and before the response was initiated; -numeral- indicates that the pauses occurred within the response.

TABLE 6: (CONT.)

INFORMATION-ELICITING QUESTION NO.	FLUENCY			MIXING			SWITCHING		
	S3	S4	S5	S4	S5	S6	S4	S5	S6
22. ¿Quenes son tus amigos?		-2-							
23. Who are the children you play with?		-1							
25. Who do you play with at school?		-2							
29. Whose house do you live in?		-5							
33. What kind of games do you like?							Sp		
34. ¿Que clase do juegos te gustan?			-1		3E			E	E
35. What kind of TV programs do you like?		-9					Sp		Sp
36. ¿Que clase de programas de television te gustan?		-2	-2						
37. What color is your house?					2E	2E			
38. ¿De que color es tu casa?				2E			E		
40. ¿De que colores son los arboles?				2D	2E				E
41. What can you tell me about this orange?	-10	-5							
42. ¿Que me puedes decir de esta naranja?					1E	1E			

TABLE 6: (CONT.)

INFORMATION-ELICITING QUESTION NO.	FLUENCY			MIXING				SWITCHING		
	S3	S4	S5	S3	S4	S5	S6	S4	S5	S6
44. ¿Que forma tiene (la naranja)?				1E				E		
46. ¿Que forma es una pelota?							1E			
49. How did you come to school?	-1									
52. ¿Como se siente el agua?									E	
53. What size are your shoes?							1E			
54. ¿Que tamaño son tus zapatos?									E	E
55. What size of shoes does your mother wear?								Sp		
59. Of all the games we play in school, which one do you like the best?	-5									
60. De todos los juegos que juegas en la escuela, ¿cuál te gusta más?										E
61. How many things are on your street?								Sp		
63. How many brothers and sisters do you have?	-10				11Sp*					
64. ¿Cuantos hermanos y hermanas tienes?						1E				
66. ¿Que tanto dinero traes?		-2-								

*Used the Spanish y eleven times.

TABLE 6: (CONT.)

INFORMATION-ELICITING QUESTION NO.	FLUENCY			MIXING				SWITICHING		
	S3	S4	S5	S3	S4	S5	S6	S4	S5	S6
69. How much water can you drink?		-4								
70. ¿Que tanta agua puedes tomarte?										E
71. How much do you weigh?		-2						Sp		
73. How much does a car weigh?								Sp		
75. How big is the school?								Sp		
76. ¿Que tan grande es la escuela?				1E						
85. Where do you sleep?		-6								
87. How far do you live from here?								Sp		
89. How far is the school from your house?			-1					Sp		
91. Which days do you come to school?								Sp		
93. When do you go to school?								Sp		
95. What do you do when you get home from school?			-2					Sp		
97. How often do you come to school?								Sp		
101. How long does it take you to get home?								Sp		
105. Why do you go to school?								Sp		
107. Why do you go to church?								Sp		
109. Why do you eat?								Sp		
111. Why do you sleep?								Sp		

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structures function as units in child speech. However, this analysis does not provide a qualitative answer to the question relative to whether or not the speed of responding to information-eliciting questions corresponds directly with measures of oral language skills, but it does appear to support the premise that thinking is a necessary condition for languaging the responses to such questions.

4.3.2 Mixing

Mixing, as used in this analysis, refers to the intrusion of lexical, syntactic and semantic systems of one of the child's languages on those of his other. This analysis revealed that the greatest number of mixes were tabulated for S4, whose English language system intruded more on that of his Spanish than the reverse. Because the questions were asked in English first, a child's responses in Spanish may have depended, in large measure, on his preceding responses given in English. The mixing may have been taught to the subjects by their parents or teacher or peers. The sophisticated teaching methods of the DISTAR program appeared to have wipped out as much mixing as possible in the responses of S1 and S2. Nevertheless, McNamara (1967, p. 69), warns us that instances of mixing are very abundant in the language of young children, and that such instances are more than a mere slip of the tongue. Besides, mixing of the two language systems does not interfere with communication in bilingual situations

with both English and Spanish interlocutors.

4.3.3 Code-Switching

Code-switching, as defined in this analysis, refers to a child responding in one of his languages to a question asked in the other. Part of a bilingual's skill is his ability to switch from one language to another. No switching was recorded for S1, S2, and S3. As with the pauses and the mixes, the greatest number of switches was tabulated for S4, who responded to twenty-two questions in Spanish that were asked in English, and to two in English asked in Spanish. S5 responsed to eight questions in English which were asked in Spanish, and S6 responded to six in English asked in Spanish, and to one in Spanish that was asked in English.

We recognized the possibility that the constant requirement to switch languages could have a disruptive effect on production in both lanugages for this age group, and could thereby wipe out differences associated with the ability to structure responses in one language independent of the other. We also looked into the possibility of the subjects translating from one language to the other. This was a frequent occurrance because of the nature of the parallel questions asked. Basically, if a subject responded in English to a question asked in English, his task was to respond in Spanish to the same question asked in Spanish, which he had already encoded in English. His ability to translate, then, involved the

ability to map English on Spanish in such a way that the new string in Spanish had the same or similar meanings as the original response in English. "The key to the mapping is meaning; and meaning is superordinate in the two languages, although related to them by the semantic networks of the two languages" (McNamara, 1967, p. 72). This description of translation, of course, does not imply that every response in English had an exact counterpart in every response in Spanish. It merely states that the questions elicited the same information in both languages, and that the majority of the words and phrase structures in responses given to questions in English were translated into corresponding words and phrase structures in Spanish as determined by reference to their meanings.

Other explanations for code-switching have been offered. It could be that the child understood but was only able to respond in one of his languages. Or it could be that he may have more adequate vocabulary for describing certain information elicited in his second (or first) language than for his first (or second) language. This lack of code consciousness was also found to be prevalent among six-and seven year-old Texas children that Cervenka (1967) tested.

5. RESULTS

The overall results of the data collected and analyzed are presented below, based on the extent to which this investigation fulfilled the seven needs expressed by the bilingual teachers who precipitated this study.

5.1 Need One

The overwhelming majority of the verbal structures in the responses in both languages to the same parallel, information-eliciting questions--arranged in an ascending order of difficulty--were the same or very similar for all six bilingual children entering school. The structures of these responses revealed that the same or similar covert mental operations, concepts and skills were evoked, whether the question elicited the information in English or in Spanish, and regardless of whether the response was in English or Spanish. Therefore, this need was fulfilled.

5.2 Need Two

This need was to determine the extent to which the instrument could be used to determine whether young Spanish-English speaking children were more proficient in verbalizing concepts and skills requisite for academic success in Spanish, or in English, or equally proficient in both in their first year of school, whether the school is bilingual or unilingual. The results revealed that one subject was more proficient in Spanish; three were equally

proficient in both languages; and one was more proficient in English. The use of the information-eliciting question instrument, therefore, proved to be an effective technique for fulfilling this need.

5.3 Need Three

This need addressed the problem of whether or not the use of the information-eliciting question instrument was an effective technique for determining the extent to which young Spanish-English speaking children can handle the lower and higher order concepts evoked equally well in both languages or better in one. Based on the data analyzed and presented in Tables 1-6 and Table 7 (in the Discussion section), S1, S2, and S6 could handle the lower and higher order concepts evoked about equally well in both languages. S3 could handle the lower order concepts evoked about equally well in both languages, but showed a definite pattern of being able to handle the higher order concepts elicited better in English. S4 could handle the lower order concepts evoked about equally well in both languages, but she handled the higher order concepts evoked better in Spanish with increased switching from English to Spanish in her responses to questions evoking the latter. S5 seemed to be able to handle the lower order concept somewhat better in English, but appeared to be able to handle the higher order concepts somewhat better in Spanish. It is to be noted that S3, S5, and S6 experienced some difficulty in handling higher order concepts in both languages. Consequently, the instrument can be effectively used

for the purpose of fulfilling this need.

5.4 Need Four

This was an expressed need to develop a technique that could be effectively used to discover the match or mismatch between the verbal language and cognitive abilities already acquired by bilingual children entering school, and those required for academic success in school related tasks. Research indicates that the young child needs to have acquired the cognitive uses of the covert mental operations, concepts and skills, and verbal language structures elicited and evoked by the eliciting-question instrument--at least the lower levels--if he is to experience a measure of academic success in school related tasks (Thurstone, 1963; Weikart et. al., 1971; Lillie, 1975). S1, S2, and S4 had acquired these basic concepts: classification (relational, descriptive, and generic), serial ordering (of sizes, quantities, and qualities), spatial relations (awareness of position, direction, and distance), temporal relations (beginning and ending of time intervals, ordering of events, and different lengths of time within time periods), and cause and effect relations. Although the verbal structures in some responses did not necessarily correspond to adult logic, they were rudimentary and typical of child thought for this age group. Viewed in this manner, they had already acquired the verbal language and cognitive abilities needed to match those required for academic success in school related tasks.

S3, S5, and S6 had acquired the ability to verbally structure and express these mental operations, concepts and skills elicited by the instrument, in large measure, at the lower levels; but they experienced some difficulty in expressing them at higher levels, particularly with temporal relations, higher order spatial relations, and to some extent, with serial ordering of quantities. These results indicate, at least, that these three children probably had not yet acquired the cognitive or mental abilities needed to match those required for academic success in school related tasks.

It is to be noted that these results corroborate somewhat the order of placement of the subjects by their respective teachers, based on their academic progress. The two first graders (S1 and S2), who were assigned to the above-average group by their teacher performed better in response to the instrument than did S3, a first grader assigned to a group comprising the lower third of his class by his teacher. Two of the Kindergartners (S4 and S6), assigned to above-average groups in their classes by their respective teachers, performed better than S5, a Kindergartner assigned to the "average" group by his teacher. Based on these results and the analyses of the data presented in Tables 1-7, this need has been fulfilled.

5.5 Need Five

This need was to know the extent to which the technique of

using information-eliciting questions would evoke verbal responses in the appropriate language, and the extent to which the subjects would mix their two languages and switch from one language to the other. The results of the data analyzed in Table 6 revealed that S1 and S2 responded in the appropriate language to all questions asked, and that the four other subjects did so with some exceptions. S3 did not switch from one language to the other, but he did mix English words with four of his responses in Spanish. S4 mixed English words with seven of her responses in Spanish, used the Spanish conjunction y eleven times in one of her responses in English, twice answered questions in English that were asked in Spanish, and switched to Spanish eighteen times to answer questions asked in English. S5 and S6 mixed English words three times each in their responses in Spanish, and switched eight and six times respectively to English in their responses to questions asked in Spanish, with the latter switching to Spanish one time in response to a question asked in English. Therefore, this need is fulfilled to the extent that the results revealed that young bilingual children will mix and switch languages in their responses to this instrumental technique.

5.6 Need Six

This need was to determine the extent to which the use of the instrumental techniques would reveal whether or not the subjects were more fluent in one of their languages, or equally fluent in

both, as measured by the number of pauses (seconds) occurring after a question was asked (after a three-second lapse of time) and before the response was initiated, and, the number of pauses occurring within responses. The results of the data analyzed in Table 6 clearly indicated that S1, S2, and S6 were equally fluent in both languages. The greatest number of pauses recorded was for S4 in her responses to questions asked in English. There was an insufficient number of pauses recorded for S5 to make an adequate judgment relative to fluency in either of the two languages. Her pauses did not appear to have adversely affected her overall production in either language. If there is a relationship between fluency, as measured here, and language proficiency, these results do not clearly establish one. Therefore, this need was fulfilled as expressed.

5.7 Need Seven

This need had reference to learning how to listen to and interpret the verbal responses of young bilingual children in the teaching-learning situation that calls language forth, using information-eliciting questions that appeal to their senses, things they can perceive in their physical and social milieus. To the extent the above six needs have been fulfilled, including the various analyses of the data presented in Tables 1-7, the review of the related literature and the integration of it throughout the report, plus the subsequent discussion, this need has been fulfilled.

5.8 Bilingual Patings

Based on the data collected and analyzed, we used a modified version of the Spolsky, Murphy, Holm, and Ferrel (1972) language assessment criteria to assign a bilingual rating to each subject on a scale ranging from two to four. The ability of S4 to structure her thought in her verbal responses to information-eliciting questions in English varied, but she seemed to do so in Spanish more easily. Subjects 1, 2, and 6 seemed to be able to structure their thought in their verbal responses to such questions equally easily in both of his languages. There was a variation in the ability of S3 and S5 to structure their thought in their verbal response to such questions in Spanish, but they seemed to be able to do so more easily in English.

6. DISCUSSION

This investigation had a threefold pu pose: (1) to design an effective instrument for questioning bilingual children entering school (2) to use that instrument to determine whether or not the language structures in their verbal responses to a given set of information-eliciting questions would reveal the covert mental operations, concepts and oral language skills elicited in English and in Spanish; and (3) to determine the extent to which the instrument could be used to assess the bilingual child's ability to initially meet the language and thought requirements for academic success in school related tasks.

The nature of the investigation--the collection and analyses of data--was based upon seven needs expressed by early childhood bilingual teachers. The overall results indicate that these needs were met as they relate to the threefold purpose of the study.

This investigation is significant because it not only offers a different approach to the study of bilingualism in children entering school, but also because of its potential contribution to bilingual research, and to planning to meet the needs of children from bilingual homes with similar or different communicative competencies. In addition, it serves as a catalytic influence for stimulating additional research. It dispels the view that the initial match or mismatch between what is required for successful performance on academic or school related tasks by bilingual children is primarily a language problem. Our data suggest that it is

a combination of problems, including (a) the capacity to consciously attend to a convention; (b) the capacity to decode that convention, re-encode it, and verbally respond to it; (c) the capacity for both inference and reference; and (d) the capacity to engage in the joint activity of conscious operational thinking, conceptualizing (symbolizing), and languaging. These capacities enable the child to manifest his thought and experiences in either or both of his languages. For example, an information-eliciting question (a convention in this case) evokes thought, which requires a set of specified components of mental operations, which get back from language by some very subtle form of conceptualization--precisely the structure of the response that corresponds to each of the components of the thought process. In this manner, how the bilingual child uses his languages as instruments of his thought is revealed.

6.1 Summary Conclusions

Based upon the results of this investigation, as these relate to the threefold purpose, the following conclusions have been extrapolated.

1. The questions were sufficiently open-ended to strongly evoke mental operations, concepts and oral language skills. They elicited simple information, greater accuracy of information supplied, greater rationality, and greater awareness of relationships (Wilkinson, 1971, p. 108). In this manner, we were able to observe the conceptual manifestation of oral language skills and

infer the inner dynamics of the thought process as revealed in the verbal structures of the responses.

2. We investigated the already formed conceptual systems of the subjects through their verbal structuring of the content of five basic concepts: classification, seriation, spatial relations, temporal relations, and cause and effect relationships. The results revealed the match or mismatch between the language and thought processes they had already acquired and those required for academic success on school related tasks. These results were based on an analysis of the verbal knowledge of ready-made language structures, which enabled us to infer the covert mental operations called into play from within as revealed in the concepts manifested and the oral language skills structured in the responses to the questions asked. In this manner, we were not only able to study the child's uses of his two languages, but to study his intellectual processes in the true sense as these relate to language and thought.

3. The instrument, in its present form, accounts for the following language and thought components: (a) specified mental operations that give birth to specified concepts, (b) the expression of these concepts by structuring them in words based upon the sensory material that the child had schematized in his physical and social environment, and (c) sensory experiences which are essential to thinking, concept formation, and receptive-expressive

language development. With these components, we were able to study bilingualism in children entering school jointly with the study of how they use their two languages to structure their thoughts and to conceptualize their knowledge. We, therefore, studied bilingualism from a perspective other than the traditional which usually puts the process on the purely verbal plane--a perspective uncharacteristic of child thinking.

4. We explored the relation of the concept to reality. In this heuristic process, as we analyzed the various phrase structures in the responses, we were able to shed some light on Vygotsky's (1962, p. 53) premise that the meaning of a given word is approached through another word. Therefore, what we discovered through this operation was a record of the relationship in the child's mind between previously formed families of words and phrase structures. From these, we gleaned his underlying concepts. In other words, we discovered something of the young bilingual child's ability to decode the information elicited and to fit it into and interpret it according to his existing conceptual system in two languages. This required a type of mental operation which called for the extension and reorganization of that conceptual system in order to transform the elicited information into a verbal response based upon already existing language structures. This further required the child to consciously attend to a convention and recognize it. This joint activity was based on some common structures, functions, and properties of objects, events and situations

that had already been conceptualized. The child made a series of verbal expressions of these referents by abstracting from them traits with which they were perceptually fused.

In our analysis we did not disregard the role played by the symbol (word or phrase structure) in the concepts manifested; nor did we simplify our analyses to the extent that there was not a perceptual fusion of the information elicited, including the mental operations, concepts and language skills revealed in the structures of the responses. This fusion was achieved by carefully structuring the questions and arranging them in an ascending order of difficulty. This accounted for the complex problem of studying the total process, which includes using bilingual subjects as their own controls. The overall results revealed the relationship between how the bilingual child uses his two languages to abstract from his environment, conceptualize it, structure it in language, and interpret it in terms of the mental operations the questions evoked. In this manner, this approach enabled us to study some of the "problems" of basic, personal concern to at least half of the world's population. This was done by investigating the functional uses of the bilingual child's two languages. These uses are the products of the social demands the child's culture has made on him. These demands, we believe, affect not only the content of his thought--his conceptualized experiences--but also his perceptions or mental operations. They also affect his ability to structure and verbally express the content of the dynamics of his thought

processes and his acquired system of organizing his concepts.

5. We combined traditional methods of studying bilingualism in children entering school with a different approach. In this manner, we studied problems related to language interference as it refers to mixing and switching from one language to the other, and fluency as measured by speed of response (Table 6). This was possible because the subjects had both a single socioeconomic status and a single level of cognitive development as determined by age, and, in the case of three subjects, two different levels of language development. Consequently, the results of the data collected and analyzed allowed us to assign bilingual ratings to each subject according to specified criteria.

6. The proper structuring and sequencing of questions can evoke both the particular levels of mental operation and the conceptual levels elicited. For this age-group, information is more easily evoked by questions containing frequently used words, with a higher proportion of concrete referents--things that appeal to their sensory modalities--and a lower proportion of abstract referents. The effect of this questioning procedure is a direct derivative of the extent to which a question evoked the retrieval and processing of a particular set of referential associations.

7. A child was judged to have developed a particular concept in a given paradigm to the extent that he decoded the task structured by a certain question, reorganized it according to his existing conceptual system, and verbalized the information elicited.

The verbalization of elicited information, however, does not guarantee that a particular concept has been mastered at more complex levels. A child's mental operations triggered in a conceptual entity may include all the operations that normatively define the concept. Yet, the paucity of meaningful experiences associated with the uses of the operations, or the quality of the experiences, can make it difficult for the child to establish useful associational linkages. Whether a concept is meaningful thus depends upon the experiential background of the child, and also the semantic structure of the concept within the question asked. Information is more easily retrieved, reorganized and fitted into the existing conceptual system, and verbalized when the child has a clear understanding of what is specifically asked for in a question. This occurs when a question requires the child to relate the information elicited to information he has already acquired.

6.2 Interpretation: Ad Hoc Analysis

Like any report of a scientific investigation undertaken for the first time, we thought it to be appropriate to conduct an *ad hoc* analysis, in order to supply our readers with additional information relative to those questions which either failed to elicit any information or evoked dissonant information--meaning that the response given was not exactly the one elicited. It helps in the interpretation of the data and accounts further for findings that on the surface may appear inconsistent.

First, we recorded the independent comments made by each investigator relative to each subject's responses, covert mental operations, concepts and skills. We then organized them according to each of the two subjects enrolled in the three independent public school districts. We made no attempt to analyze for age and sex differences; we based this analysis on the single factor relative to the children entering school for the first time during the academic year of 1974-75. In the process, we reduced any idiosyncratic froms of comments which carried the same message to only one statement. It is to be noted also that while much of the detail in each investigator's comments is omitted, that detail is not directly relevant to the question being examined here; that is, "Which questions either failed to elicit any information or evoked dissonant information?" Consequently, this analysis gives the reader a general idea of the data which served to make up the tabulations. To include all comments would involve a reproduction of the raw data, a not so plausible alternative, albeit an interesting one (Natalicio & Williams, 1971, p. 34).

It is to be noted that the positive comments relative to the questions and to the subjects who gave appropriate responses far outnumbered those relative to information not elicited or evoked. The former are implicit in the latter. This analysis provides a description of each child's thought and language baselines, aspects of which might also serve as the focus of attention in a bilingual instructional program. Since the primary purpose of oral language

assessment would seem to be that of serving as input to instructional programs, this analysis is particularly useful for the individualization of language instruction.

It also serves the investigator who might decide to replicate this study or improve the instrument, because it offers some insight into its shortcomings in its present form. In the process, it provides the future investigator with additional data, which can be used to analyze the nature of the problem, predict consequences, hypothesize and explain familiar phenomena, determine causal links leading to predictions or hypotheses, explain and support predictions, use factual knowledge to determine necessary and sufficient conditions for assessment, and verify predictions or hypotheses. The data presented in Table 7 illustrates specifically the number of the corresponding questions (appendix) that either failed to elicit any information or evoked dissonant information. Since we could not analyze information not given, only the latter is discussed here.

In response to question #33, (What kind of games do you like?), S1 responded: "Football and baseball," and S2 responded: "Chinese jump rope." In response to the parallel question #34 (Qué clase de juegos te gustan?), S1 responded: "Fútbol y Béisbol," and S2 responded: "A jugar pelota." In response to question #35 (What kind of TV programs do you like?), S1 responded: "Let's Make a Deal," and S2 responded: "Truth or Consequences." In response to the parallel question #36, (¿Qué clase de programas de

TABLE 7: QUESTIONS EVOKING NO INFORMATION OR DISSONANT INFORMATION

INFORMATION - ELICITING QUESTION NO.	NO INFORMATION EVOKED					DISSONANT INFORMATION EVOKED					
	S3	S4	S5	S6		S1	S2	S3	S4	S5	S6
1.								X	X		
13.	X										
19.	X		X								
25.	X										
27.		X	X								
29.								X	X		
31.	X	X	X								
32.	X	X	X								
33.							X			X	
34.	X									X	
35.						X	X				
36.	X					X	X				
47.	X		X	X					X	X	
48.	X		X						X	X	X
49.							X				
50.	X						X		X		
52.	X										
55.			X	X							
57.			X	X							
60.	X										
61.			X						X		
64.									X		
65.	X										
66.	X			X							
68.	X										
71.			X	X							
72.	X		X	X							
73.	X		X	X							
74.	X		X	X							
75.	X										
76.	X										

77.	X					X	X					
78.	X					X	X					
81.									X			
87.	X		X									
88.	X		X									
90.	X											
91.			X	X								
92.	X		X	X								
93.			X	X								
94.	X			X								
97.	X		X									
98.			X	X								
99.								X	X			
100.								X				
101.							X					
102.	X			X			X					
103.			X	X								
104.	X		X	X								
107.			X									
108.	X		X									
111.	X								X			
SUBTOTAL: ENGLISH	12	2	5	8		2	5	2	7	2	1	
SUBTOTAL: SPANISH	20	1	9	8		2	4	2	3	2	0	
TOTAL	32	3	14	16		4	9	4	10	4	1	

television te gustan?), S1 responded: "Chapulin," and S2 responded: "A ver siempre Habrá un Mañana." Apparently both subjects could handle the concepts at one level, but could not at a higher level which required the chunking of descriptors into a generalized concept such as "cops and robbers," "cowboys or westerns," "cartoons," and the like. According to Vygotsky (1962, p. 60), in perception, in thinking, and in acting, the child tends to merge the most diverse elements into one unarticulated image on the strength of some chance expression. This is the result of a tendency to compensate for the paucity of well-apprehended objective relations by an overabundance of subjective connections, and to mistake these subjective bonds for real bonds between things.

Apparently S2 understood questions #49 and #50, (How did you come to school?, and ¿Cómo llegaste a la escuela?), to mean With whom. . .? and ¿Con quién. . .?, because her responses were "With my mother and grandma," and "Con mi mamá y con mi abuela" respectively. These responses indicate that the child was aware of who takes her to school, but may not have been able to handle the concept of manner or method as it refers to transportation. Her responses to questions #101 and #102, (How long do you stay in school?, and ¿Qué tanto tiempo te quedas en la escuela?), were "Five days," and "Cinco días" respectively. These responses indicate that the child had not yet mastered the concept of lengths of time within time periods such as six hours per day; although she had the rudiments of the generalized concept of temporal relations.

S1 had conceptualized the concept of bigness when it referred to the school, as in questions #75 and #76, (How big is the school?, and ¿Qué tan grande es la escuela?), because he responded: "Very big," and "Muy grande" respectively. However, when asked questions #77 and #78, (How big is your house?, and ¿Qué tan grande es tu casa?), he responded: "Ten feet tall" and "Diez pies pa arriba" respectively. 2 responded to these questions (#77 and #78) using more precise measures of height: "About twelve feet tall," and "About ten feet tall" respectively. She obviously realized that the school is taller than her house. However, her response was "Grande" to both questions #76 and #78. Vygotsky (1962, p. 60) argues that these syncretic relationships, and the heaps of objects assembled under one word or phrase meaning, also reflect objective bonds in so far as the latter coincide with the relations between the child's perceptions or impressions. However, the child's and the adult's meanings of a word or phrase often "meet" as it were, in the same concrete object, and this suffices to ensure mutual understanding. Therefore, the height and size of an object may be grouped or "heaped" together, because they are perceived together. This further indicates that syncretic thinking is the lowest level of thought, based simply on perception without a logical relationship between the structure and attributes of objects.

The concept of an object such as a house is learned as a set of associational and descriptive features, including its structure (size and shape), function (a place to live in, to sleep, eat, etc.), and its properties (wood, brick, color, etc.). These referents

are semantically related as they exist in space and time. They are abstracted and mediated by words and phrases. However, if the young child has not reached the stage of thinking in complexities, such a variety of associates offer greater possibilities of referential interference.

Consequently, questions eliciting information about objects that have the same features in common may evoke like responses from the young child. In addition, it is not atypical of child thought to equate bigness with tallness or height in reference to concrete objects. It is equally important to note that these concepts trigger very similar mental operations but different language representations. It is also important to note that a child does not master these concepts until he has reached the cognitive level of conservation, which normally develops at a later age.

Based upon the responses given by S3 and S4 to question #1, (What is in your house?), both understood in to mean at. Their responses were "A car," and "Trees" respectively. Because en in Spanish translates at, in, or on in English they could have superimposed the Spanish meaning of en or the English in, and used it to mean at. This was again observed in the response by S3 to the parallel question in Spanish: "¿Que hay en tu casa?" However, neither faulty translation nor misinterpretation occurred in their responses to questions #9 and #11, and #12, which included in and en respectively. In response to Questions #31 and #32, both subjects indicated that there were no stores near their houses, after haveing been asked if there were.

When asked question #29, (Whose house do you live in?), both S3 and S4 responded: "White and Yellow," and "Brown" respectively. The same responses were given to questions #37 and #38, (What color is your house?, and ¿De qué color es tu casa?). They apparently understood "Whose. . .?" to mean "What color. . .?" S4 apparently understood the Where in question #81, (Where are your brothers and sisters?), to mean Who, because her response in Spanish was "Lamo y Janie." S3 and S4 apparently understood "How often. . .?" in question #99 to mean "How fast. . .?" and "Where. . .?" Their responses were "Slowly" and "The table" respectively. To #111 (Why do you sleep?), her response in Spanish was "En la cama." This indicates that she apparently understood "Why. . .?" as "Where. . .?" The response of S3, "Un plato," to question #100 (¿Qué tan sequido comes?) indicates that he probably understood it to ask "¿Cuánto puedes comer?"

Young children do not, as they see it, fail to understand such questions. They assign their own interpretations to the structures presented to them (Chomsky, 1969). In order to decode, encode, and recode the particular information elicited by a question, the child must engage in both inferential and referential processes which make use of his knowledge of the general meaning of words as well as his knowledge of the overall situation to which a question as a whole refers (Jakobovits, 1969).

S6 gave an appropriate response "In the house," to question #81, but when asked the parallel question #82 (¿Dónde están tus

hermanos y hermanas?), she responded: "No tengo hermanas." However, her response to question #63, (How many brothers and sisters do you have?), was "One brother and one sister," but her response to the parallel question #64 (¿Cuántos hermanos y hermanas tienes?), was "No tengo." The fact is she did not have any brothers and sisters. Therefore her responses in English were syncretic, based on her perception of the meaning of the questions.

Questions #33 and #34 elicited similar responses from S5 as did from S1 discussed above. He, too, could not chunk descriptors into a generalized concept. S6 did not respond to #69 but responded similarly, "Grande," to #70 as did S4 discussed above.

It appears that S4 translated the is in question #47, (How is your mother?), to mean the same as the es in Spanish when used in that syntactic context, because in her response she gave a permanent characteristic or condition: "She's big." However, when asked the parallel question #48, (¿Cómo está tu mamá?), her response was "Grande, y mi papá está más grande que mi mamá." Besides the fact that her responses were based simply on perception, she apparently was not yet able to distinguish between the uses of ser and estar in Spanish, her first language, which could have caused the misconception of the English in that syntactic context. Her response to question #49, (How did you come to school?), was "More and more and more." This indicates that she may have understood the question to ask "How often. . .?" She gave an appropriate response in Spanish to the parallel question #50.

In her response to question #63, (How many brothers and sisters do you have?), S4 listed sixteen proper names. She obviously understood the question, but had not yet mastered the process of grouping in terms of number. This view was further supported by her response to the parallel question #78, which was "Muchos."

The responses and lack of responses by S3 to questions #97-#100 indicated that he had neither mastered the concept of "How often. . .?" in English nor that of "¿Qué tan seguido. . .?" in Spanish. However, he could handle the concept in Spanish, when "¿Qué tantas veces. . .?" was used as an alternate to question #98; his response was "Como tres." To question #89, (How often do you eat?), S4 responded: "The table."

Typical of child thought for this age group were the responses given by S6 to questions #111 and #112 (Why do you sleep?, and ¿Por qué duermes?): "Because it's night," and "Porque es noche" respectively. These indicate that the child was not yet able to relate sleepiness with the need to sleep, but rather associated the need to sleep with night. This also indicates that she grouped the meaning of the question at the syncretic level, and spontaneously used <u>because</u> and <u>porque</u> correctly. However, this does not indicate that she knew how to use them deliberately, because she was unable to realize that the question did not refer to the separate facts of sleep and night, but to a connection between sleep and sleepiness. According to Piaget (1969, p. 171), scientific causality is not innate, but structured little by little, and this

process of construction presupposes not only an adaptation of the mind to reality but also a correction of the initial egocentrism of thought. This initial egocentric thought undergoes a structural transformation with age and experience and matures into the logical concept of cause and effect relationships.

6.3 Theory

Because this investigation is a different approach to the study of bilingualism in children entering school, and because it includes a number of related findings, we thought it appropriate to integrate these findings and formulate a relevant theory, which emerged from an already existing theory. Our objective was to make the findings part of a comprehensive body of theory. A creative theory has the content of experience and the logic of experimentation to support it (Hawkins, 1965). Based on this premise, the theory that we abstracted from the findings of this investigation is "the verbal response to an information-eliciting question theory." That is, the structure in the verbal response to an information-eliciting question is a function of consciously attending to and the perception of a convention, including both the capacity for inference and for reference, which triggers the activation of covert mental operations, concepts and oral-language skills already acquired by the respondent. This theory is equally applicable to the creative process, since the creation of a new idea usually emerges from relating and reorganizing old points

in such a way that they give birth to a new or different one.

In short, it accounts for which forms of eliciting questions evoke which verbal structures that manifest what concepts and oral language skills that trigger which mental operations in the responses of the child.

As conceptualized in this study, these three cognitive tasks (covert mental operation, concept and skill revelation, and the verbal structuring of responses) have several things in common. First, the mastery of operation elicited by the question is required to reveal the overt concepts and skills as structured by the responses. This entails a sequence of steps. For example, in order to conceptualize and structure responses to questions arranged in a hierarchy difficulty, the operations need to be mastered in a certain sequential order: generic classification combined with differentiation, which involves determining the basis for classifying and labeling, which involves creating superordinate classes.

Indirectly, this conception of the hierarchy of difficulty in levels of mental operations also involves the principle of rotation of assimilation and accommodation (Taba, 1967). This principle implies that the information elicited by the question is at first fitted into and interpreted according to the existing conceptual system. This is followed by a type of mental operation which calls for the extension and reorganization of that conceptual system in order to transform the elicited information into

a verbal response based upon the existing language structure. In determining cause and effect relationships, for example, relating points to each other requires a certain degree of high level mental activity to structure the response that explains the associations already acquired.

This means that the nature of the mental operations, concepts and skills, and the structures of the responses depend upon the nature of the eliciting questions. Each conceptual focus (i.e. classification, seriation, spatiol-temporal relations, and causal relations) requires a special set of questions and a special sequencing of them. Each question is designed to elicit a special kind of overt activity (manifested in the structures of the responses), which in turn fosters or requires the covert mental operation, such as differentiation in the case of listing and seeing causal relations in the case of explaining associations. These covert mental operations are the bases which determined the sequence of the eliciting questions. For example, in the task of generic classifying, the first question takes the form of "What is in your house?" This calls for listing of items already conceptualized. From there the child must decide what belongs together. This overt activity calls for identifying items commonly found in the home. These items become the basis for classifying. Finally, it is necessary to label the classifications or to structure them in verbal language.

In these operations each step is a prerequisite for the next one.

One cannot label until some prior classifying has taken place and one cannot classify until the items have been differentiated.

For the cognitive task of seeing causal relations, the overt activities are identifying points and explaining these identified items. These in turn require the covert mental operations of differentiating and comparing. An eliciting question is "Why do you eat?" Such a question requires the child to retrieve relevant information, and use available information in order to structure his responses in order to explain the causal relations.

6.4 Pedagogical Applications

Since the primary purpose of assessing bilingualism in children entering school would seem to be that of serving as an input to bilingual education programs, the results of this investigation are particularly useful for the individualization of bilingual instruction. An effective technique of questioning children is offered, whether the school is bilingual or unilingual.

Although the eliciting-question instrument is by no ways complete, as suggested by Taba (1967), the question forms in this instrument can also serve specific pedagogical function. They can focus the child. They set the stage for both the kind of mental operation to be performed and the content on which this operation is to be performed. In other words, the questions tell the child what he is to talk about (such as people, material things or objects, events and situations that encompass his interactions in

his world--home, neighborhood and school). They also tell him what he is to do with the content (whether he is to classify, seriate, point out spatial relations or temporal relations, and causal links).

Another pedagogical function is that of extending on the same level. For example, after a child has responded to a certain question, it is important to encourage him to go beyond what has been given by asking questions such as "What else is there?" "What do you do before you eat dinner?" "What do you do after you eat dinner?" "Which days don't you go to school?" "Why don't you go to school on Saturdays?" In order to encourage others to add their ideas in group situations, the teacher can seek additional information on already established levels of thought in order to elaborate and categorize information already provided.

Finally there is a pedagogical function of making a transition from one level of thought to another, such as from generic classification to determining causal relations--both spatial and temporal--by analyzing, comparing, and explaining certain items in identified information. According to Taba, this is a method of changing the focus or lifting of thought to another level.

This instrument can be administered to bilingual or unilingual children entering school early in the academic calendar year. This would allow the teacher to determine the match or mismatch between the language and thought processes required to experience a measure of success with school related tasks and those already acquired by

the children at the time they enter school. This would aid in the proper planning and sequencing of learning and teaching experiences, including the establishing of criterion-referenced objectives and the arrangement of a learning-teaching situation that calls language forth and evokes reasoning processes. The instrument as a whole or its subparts can again be administered intermittently during the school year to determine developmental progress, and again at the end of the year to determine overall conceptual and language development as related to instruction and learning.

6.5 Suggestions for Extensions

We suggest that an improvement over the information-eliciting question instrument would be to include samples of children's questions of the same age group as the subjects, from similar socioeconomic backgrounds. This would allow the researcher to compare the covert mental operations, concepts and oral language skills of children when they are asked to respond to an adult convention or standard with those given to a child convention. We also suggest that the planners of programs concerned with the education of young bilingual children replicate this study with a representative sample of the population to be served, in order to match the language and thought processes required for academic success on school related tasks with those that the children have already acquired. The results of such a study would provide fresh evidence and insights for implementing such programs. If this investiga-

tion only serves as a catalytic influence for stimulation other relative research, our mission would have been accomplished.

The experience and insights gained from conducting this investigation suggest the desirability and the plausibility of continuing the development and refinement of the instrument. However, we advise that caution be applied in the utilization of the results of this investigation. In any assessment procedure, children may have abilities for which there is no occasion, and lack abilities for occasions into which they are faced. In addition, caution should be used in generalizing these results across the larger population. In spite of the premise that linguistic representations may be quite constant across individuals in a given culture, the meaning imbedded in a child's response to a convention will reflect the idiosyncrasies of his individual experience.

APPENDIX

INFORMATION-ELICITING QUESTIONS

INFORMATION-ELICITING QUESTIONS

Classification

1. What is in your house?
2. ¿Qué hay en tu casa?
3. What is in your classroom?
4. ¿Qué hay en tu cuarto?
5. What do you do at home?
6. ¿Qué haces en la casa?
7. What do you do at school?
8. ¿Qué haces en la escuela?
9. What do children do in the classroom?
10. ¿Qué hacen los niños en la clase?
11. What do you see in the classroom?
12. ¿Qué ves en el cuarto?
13. What do you see in the yard?
14. ¿Qué ves en la yarda?
15. What do children see in the classroom?
16. ¿Qué ven los niños en el cuarto?
17. Who is your teacher?
18. ¿Quién es tu maestra?
19. Who is your mother?
20. ¿Quién es tu mamá?
21. Who are your friends?
22. ¿Quiénes son tus amigos?
23. Who are the children you play with?
24. ¿Quiénes son los niños con que juegas?

25. Who do you play with at school?

26. ¿Con quiénes juegas en la escuela?

27. Who do you live with?

28. ¿Con quién vives?

29. Whose house do you live in?

30. ¿De quién es la casa donde vives?

31. Is there a store near your house?

    Whose store is it?

32. ¿Hay una tienda cerca de tu casa?

    ¿De quién es la tienda?

33. What kind of games do you like?

34. ¿Qué clase de juegos te gustan?

35. What kind of TV programs do you like?

36. ¿Qué clase de programas de television te gustan?

37. What color is your house?

38. ¿De qué color es tu casa?

39. What color are the trees?

40. ¿De qué colores son los árboles?

41. What can you tell me about this orange?

42. ¿Qué me puedes decir de esta naranja?

43. What shape is it (the orange)?

44. ¿Qué forma tiene (la naranja)?

45. What shape is a ball?

46. ¿Qué forma es una pelota?

47. How is your mother?

48. ¿Cómo está tu mama?

49. How did you come to school?

50. ¿Cómo llegaste a la escuela?

51. How does water feel?

52. ¿Cómo se siente el agua?

Serial Ordering

53. What size are your shoes?

54. ¿Qué tamaño son tus zapatos?

55. What size of shoes does your mother wear?

56. ¿Qué tamaño de zapatos usa tu mamá?

57. Which is bigger, a dog or a horse?

58. ¿Cuál es más grande, un perro o un caballo?

59. Of all the games we play in school, which one do you like the best?

60. De todos los juegos que juegas en la escuela, ¿cuál te gusta más?

61. How many things are on your street?

62. ¿Cuántas cosas hay en tu calle?

63. How many brothers and sisters do you have?

64. ¿Cuántos hermanos y hermanas tienes?

65. How much money do you have?

66. ¿Qué tanto dinero tienes?

67. How much money does your mother have?

68. ¿Qué tanto dinero tiene tu mamá?

69. How much water can you drink?

70. ¿Qué tanta agua puedes tomarte?

71. How much do you weigh?

72. ¿Qué tanto pesas?

73. How much does a car weigh?

74. ¿Qué tanto pesa un carro?

75. How big is the school?

76. ¿Qué tan grande es la escuela?

77. How big is your house?

78. ¿Qué tan grande es tu casa?

Spatial Relations

79. Where is your mother?

80. ¿Dónde está tu mama?

81. Where are your brothers and sisters?

82. ¿Dónde están tus hermanos y hermanas?

83. Where do you eat?

84. ¿Dónde comes?

85. Where do you sleep?

36. ¿Dónde duermes?

87. How far do you live from here?

88. ¿Qué tan lejos vives de aquí?

89. How far is the school from your house?

90. ¿Qué tan lejos está la escuela de tu casa?

Temporal Relations

91. Which days do you come to school?

92. ¿Cuáles días vienes a la escuela?

93. When do you go to school?

94. ¿Cuándo vas a la escuela?

95. What do you do when you get home from school?

96. ¿Qué haces cuando llegas de la escuela?

97. How often do you come to school?

98. ¿Qué tan seguido vienes a la escuela?

99. How often do you eat?

100. ¿Qué tan seguido comes?

101. How long do you stay in school?

102. ¿Qué tanto tiempo te quedas en la escuela?

103. How long does it take you to get home?

104. ¿Qué tanto tiempo duras para llegar a la casa?

Course and Effect Relations

105. Why do you go to school?

106. ¿Por qué vas a la escuela?

107. Why do you go to church?

108. ¿Por qué vas a la iglesia?

109. Why do you eat?

110. ¿Por qué comes?

111. Why do you sleep?

112. ¿Por qué duermes?

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